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U.S. Forest Service

The National Forest Manual.

Instructions relating to Forest Products, 1913

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U. S. DEPARTMENT OF AGRICULTURE,
FOREST SERVICE.
HENRY S. GRAVES, Forester.

THE NATIONAL FOREST MANUAL.

INSTRUCTIONS RELATING TO FOREST PRODUCTS.

ISSUED BY THE
SECRETARY OF AGRICULTURE
TO TAKE EFFECT
MAY 1, 1913.

WASHINGTON:
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THE NATIONAL FOREST MANUAL.

UNITED STATES DEPARTMENT OF AGRICULTURE,
FOREST SERVICE.
Washington, D. C., April 23, 1913.

The following procedure and instructions relating to investigations in forest products are hereby established and issued to take effect May 1, 1913.

H. S. GRAVES,
Forester.

Approved:
B. T. GALLOWAY, *Acting Secretary.*

PURPOSE AND ORGANIZATION OF THE BRANCH OF FOREST PRODUCTS.

FIELD OF WORK.

Purpose.

The purpose of this Branch of the Forest Service is to promote the most profitable and economical utilization of forest products. Its work consists of:

Scope of work.

(1) Statistical and industrial studies of the production and use of wood.

(2) Experimental determination of properties, methods of treatment, and special products obtainable from wood.

(3) Application of experimental data on an industrial scale to check results and demonstrate their commercial value.

(4) Promotion of better utilization of products of the National Forests.

Preference to National Forest problems.

The function of the Branch is both to assist timber owners and manufacturers throughout the United States and to aid in the administration of the National Forests. Preference will be given, however, to investigations related directly to improved utilization and current business on the National Forests.

ORGANIZATION.

Administrative head.

The administrative direction of the activities of the Branch is vested in an Assistant Forester in Washington, D. C., designated by the Forester.

Divisions.

The work of the Branch falls into three divisions, each under the supervision of the assistant forester in charge: (1) National Forest Utilization; (2) the Forest Products Laboratory; and (3) Industrial Investigations.

FOREST PRODUCTS LABORATORY.

Purpose.

The field of the Forest Products Laboratory is to conduct technical studies and experiments designed primarily to add to the existing knowledge of the properties and constituents of wood and to develop new processes or methods of utilization having economic value. It is also the function of the Laboratory to follow up technical experiments by the commercial application of their results, as far as may be practicable, on an industrial scale. In general no investigation will be considered complete until the experimental results obtained at the Laboratory have been checked on a commercial scale and their industrial value demonstrated.

Direction of technical work.

The Laboratory directs all of the strictly technical and scientific work of the Branch of Products within its field and the methods of experimental investigation employed. As far as practicable, technical investigations will be concentrated at the Laboratory. Where advisable to conduct such investigations elsewhere, this will be done: (1) by an expert detailed from the Laboratory for the purpose and working under its immediate direction; or (2) by a local member of the Service working under the direction of the executive officer of the unit concerned, but in accordance with plans approved by the Laboratory and such further supervision and inspection as the Director considers necessary. The supervision of Products experts in the National Forest districts by the Laboratory extends only to technical or scientific investigations conducted under the working plan procedure as defined on page 25, and is exercised through the district foresters.

Organization.

The Forest Products Laboratory is located at Madison, Wis., under the immediate supervision of a Director who reports to the assistant forester in charge of the Branch.

Administrative assistants.

Such administrative assistants as are required will be designated by the director to assist him in supervising the work of the Laboratory and to perform special duties.

Sections.

The work of the Laboratory is divided into sections corresponding with the major lines of investigation and designated by the director with the approval of the assistant forester. Each section is in charge of a section chief.

Committees.

The director of the Laboratory will designate from time to time such committees as he deems advisable to pass upon working plans for projects in particular lines of investigation. The aim will be to bring together in each committee the members of the Laboratory staff whose experience and capacity in the particular line of investigation or related investigations will make their scrutiny of a working plan of the greatest value in accomplishing the best results under a proposed project. Such committees will form a permanent feature of the organization of the Forest Products Laboratory, but their personnel may be changed from time to time as the director sees fit.

Advisory board.

There will be associated with the Laboratory an advisory board consisting of experts of the widest possible experience and national standing in the various lines of investigation conducted at the Laboratory and the requirements of the industries which such investigations should benefit. Arrangements will be perfected as far as possible for experts of this character to spend several weeks each year at the Laboratory going over the plans of work, the methods employed, and the results obtained in specific projects, and advising the director and members of his staff on any features of the work which can be improved. The members of the advisory board individually, will thus act as inspectors but not in any executive capacity. The director will act upon their recommendations in so far as advisable in his judgment. Recommendations of the members of the Board which in his judgment should not be put into effect will be submitted to the assistant forester in charge of the Branch with a statement of his views thereon, for final decision.

Field of work.

Investigations are conducted at the Forest Products Laboratory and in cooperation with persons engaged in various wood-using industries, and information disseminated by publication and otherwise along the following lines:

(1) Mechanical properties of wood.
(2) Physical characteristics and properties of wood.
(3) Chemical characteristics and properties of wood.
(4) Air seasoning and artificial drying of wood.
(5) Agencies destructive to wood.
(6) Wood preservation.
(7) Wood distillation.
(8) Production of naval stores.
(9) Production of pulp and paper and other chemical products of wood.

NATIONAL FOREST UTILIZATION.

Purpose.

The function of experts employed in the National Forest districts is to assist and advise the district foresters on market and utilization problems involved in current National Forest business. Investigations conducted by such experts will be restricted largely to those having a direct bearing upon administrative problems. Scientific studies involving technical processes or experiments will ordinarily be undertaken only when necessary as part of an investigation required for administrative purposes. Other technical investigations may be undertaken in exceptional cases to assist the Forest Products Laboratory or the Office of Industrial Investigations in their respective fields of work.

Utilization of National Forest timber.

It will be the duty of experts assigned to districts to investigate as completely as possible all utilization and market problems arising in the administration of National Forests. Such work should be conducted in cooperation with reconnaissaince parties obtaining data on stand, species, and topography, with the district engineers in secur-

ing data on water supply and available power, and with any other officer or unit of organization in the district whose work bears on the particular investigation in hand. The aim of such investigations will be: (1) to compile all published or manuscript data obtainable bearing on the problem; (2) to secure all necessary information on the physical conditions involved, as stand, species and quality of timber, available water power, distance from shipping points, freight rates to most accessible markets, and the like; and (3) to indicate what special studies of a technical or experimental nature, if any, should be undertaken to complete the study. Such a preliminary investigation will be embodied in a report on which direct action can be taken by the district forester or assignments for further investigation made by the assistant forester in charge of the Branch.

Organization.

Products experts in the several districts are under the direction of and directly responsible to the district foresters. Their relationship to the district forester is the same as that of other members of the district office staff. The district forester is responsible for the assignment of such experts to the problems which they should study and for the supervision of their work. Their duties should be correlated with those of the district office of Silviculture, and where advisable such experts may, with the approval of the assistant forester in charge of Forest Products, be placed under the administrative direction of the chief of Silviculture. Their work will be under the supervision of the assistant forester in charge of the Branch, through the district forester, in the same manner as that of district officers assigned to Silviculture or Grazing.

Field of work.

The field of Products experts assigned to National Forest districts embraces all investigations and problems connected with the use and marketing of National Forest timber, the construction of improvements on the Forests, and related administrative questions. The following are included:

(1) Studies of existing industries, covering methods and costs of manufacture, grades or other specifications of manufactured products, and prices obtained for manufactured products. The collection of market prices, mill scale studies to determine grades and overrun, and investigations of kiln-drying methods come under this heading.

(2) Waste in existing industries and closer utilization possible through improved methods.

(3) New uses for National Forest species through wood preservation.

(4) Introduction of industries which will result in closer or more profitable utilization, as the manufacture of pulp and paper, wood distillation, turpentining, and the manufacture of secondary wood products.

(5) Market prejudices against particular species or classes of material and means of overcoming them through special studies or publicity.

(6) General questions of timber supply and demand, markets, and freight rates, which the district forester deems it advisable to study.

(7) Advice and assistance in the construction of National Forest improvements, particularly in the use of wood preservatives.

(8) Advice and assistance to persons in the respective districts, outside of the Forest Service, on any of the foregoing or related questions.

(9) Preparation of publications on any subjects covered by the foregoing investigations which have practical or scientific value.

(10) Demonstrations of methods or processes developed by the Forest Service for the benefit of local industries.

Duties of forest supervisors.

To make Products work in the National Forest districts of the greatest value it is essential that supervisors bring to the attention of the district foresters any problems bearing on the foregoing or related subjects which exist on their Forests. The presence of large quantities of unmarketable species, of dead timber, or of material not used in current sales should be reported. Local problems in manufacture and marketing like sap stain, difficulties in kiln drying, market prejudices against usable material, and the effect of given silvicultural methods upon the average grades of lumber manufactured should be taken up with the Products experts at the district office. Supervisors are expected to cooperate in studies along any of these lines and in more general investigations, such as local supply and demand for stumpage, which the district forester orders.

Preservative treatment of material used in improvements.

Forest supervisors should also bring to the attention of the district foresters their needs for assistance in applying preservative treatment to telephone poles, posts, and other material used in the construction of National Forest improvements. Important projects requiring such timbers should be discussed in advance with the Products expert in order that plans for preservative treatment may be thoroughly considered and applied if found advisable. In the discretion of the district forester, small treating plants may be constructed and operated on or near National Forests where of value to the Forests and the community. The object of such plants will be to facilitate National Forest improvements and to educate the people in the use of preservatives. Recommendations for their establishment should be made by supervisors when advisable in their judgment.

INDUSTRIAL INVESTIGATIONS.

Purpose.

The function of the Office of Industrial Investigations is to conduct statistical and industrial studies of uses of wood in the United States. The aim of these investigations is to determine the methods and conditions under which wood is now used, the marketable products obtained from it, tendencies in methods of manufacture, and improved methods possible particularly in the utilization of waste. When practicable such investigations will be followed by the commercial application of their results. This unit also directs all statistical investigations of the production and use of forest products conducted by the Forest Service and standardizes the methods employed.

Organization.

Industrial Investigations is an office in the Branch of Products, under an executive officer at Washington, D. C., designated "Chief

of Industrial Investigations," who reports directly to the assistant forester in charge of the Branch.

Field of work.

The work of Industrial Investigations includes the following:

(1) Collection and compilation of statistics, in cooperation with the Bureau of the Census and other agencies, on the production and consumption of forest products, prevailing market and stumpage prices, imports and exports, and transportation rates.

(2) The compilation and study of specifications of rough and manufactured forest products.

(3) Studies of lumber manufacture and wood-using industries as to methods, forms of material, waste, costs, equipment, substitution of one species for another, and improvements through more conservative use of raw material.

(4) Studies of special problems or features of wood-using industries.

(5) Advice and assistance through cooperative agreements and otherwise to States, industries, and individuals concerned with such lines of work.

(6) The dissemination of results by publications.

Duties on eastern Forests.

The Office of Industrial Investigations will also assist on market and utilization problems arising in the administration of National Forests acquired in the Eastern States and conduct such special investigations as may be required for this purpose. Its duties in this respect are analogous to those of Products experts in the National Forest districts.

STATIONS.

For convenience, places other than the headquarters of the various units of the Branch where work is to be conducted for a considerable period will be designated as "stations." Each station will be in charge of a station chief, who will be directly responsible to the executive officer of the unit to which the station reports. Stations of a permanent character will be established only with the approval of the Forester. Temporary stations may, however, be established whenever it is deemed expedient to do so by the proper executive officer.

EXECUTIVE OFFICERS.

The term "executive officer" as used in this manual means either: (1) a district forester; (2) the director of the Forest Products Laboratory; or (3) the chief of Industrial Investigations.

CORRELATION BETWEEN DIFFERENT UNITS.

Close correlation between the various units comprising the Branch of Products is essential to the effectiveness of the work of the Branch as a whole. The following summarizes the more important features of such correlation.

DISTRICT OFFICES AND FOREST PRODUCTS LABORATORY.

Administrative investigations.

Investigations for administrative purposes will be initiated and directed by the district foresters. The staff of the Forest Products Laboratory will assist in such investigations which come within its field by furnishing outlines of the information to be obtained and by personal conference with the district foresters and members of their offices, but will have no supervisory relationship to this work.

Technical investigations.

Technical investigations in the several districts, forming part of the annual program, will be conducted in accordance with working plans approved by the director of the Laboratory, when within its province. Their results will be reviewed by the Laboratory staff before publication. As far as practicable such investigations will be concentrated at the Laboratory itself, but where conducted in the districts will be under the supervision of the Laboratory staff as defined on page 6.

Special assignments of Laboratory staff.

Members of the Laboratory will not be assigned to special investigations in any of the districts until the ground has been covered as fully as practicable in a preliminary study by the Products expert in the district. The results of this study will be embodied in a preliminary report which should indicate specifically what further investigations requiring specialists from the Forest Products Laboratory should be undertaken. Requests for the assignment of experts from the Laboratory for such investigations in the districts will be submitted to the assistant forester in charge of the Branch, with a copy of the preliminary report showing the specific problems to be solved. At the same time a copy of the report and of the letter requesting the special assignment will be sent to the director of the Laboratory who will immediately submit his recommendations and suggestions in the matter to the assistant forester. The latter will then decide whether the assignment requested should be made and send necessary instructions to the director of the Laboratory.

Tests of field material.

Material will be submitted to the Forest Products Laboratory by district foresters for special tests, and other experiments requested whenever necessary for administrative purposes and particularly for the better utilization of National Forest timber. When such tests or experiments are not of immediate urgency, a request should be submitted to the director of the Laboratory for the incorporation of the investigations proposed in the next annual program, unless the director finds it practicable to include the tests in current investigative projects. If the work desired by a district forester, however, is of immediate urgency, the request will be submitted directly to the assistant forester in charge of the Branch, a copy being sent simultaneously to the director of the Forest Products Laboratory. The director will immediately submit to the assistant forester his recommendations and suggestions in the matter. The latter will then decide whether the work proposed should be given preference

over the established program of investigations at the Laboratory, and instruct the director and the district forester accordingly. The approved program of investigative work will not be disturbed to make tests or conduct other studies proposed by district foresters which are not of direct and immediate importance in the administration of the National Forests. Urgent work of this character from the Forests will, however, with the approval of the Forester, be given precedence over the established program of the Laboratory. Material should not be shipped to the Laboratory until the tests desired have been approved by the director or assistant forester.

Current information and advice.

The foregoing should not be understood as limiting the fullest possible cooperation between the Forest Products Laboratory and the district foresters, in securing currently information on specific problems, advice, or suggestions on methods of attacking new problems.

Conferences.

To keep the Laboratory staff in touch with problems arising in the districts and to enable it to cooperate most effectively along the lines indicated, the director will visit the National Forest districts from time to time for conferences on the ground. Products experts assigned to districts will similarly be kept in touch with the work of the Laboratory by occasional details. The interchange of monthly and annual reports will furnish an additional medium for keeping the Laboratory and district officers mutually informed of the work of other units.

DISTRICT OFFICES AND INDUSTRIAL INVESTIGATIONS.

Working plans for industrial studies.

Working plans for statistical studies and studies dealing with industries or species in their entirety will be approved by the Chief of Industrial Investigations. The results of such studies will be reviewed by him prior to publication. Any problems arising on National Forests whose solution will be facilitated by special studies in the east in the field of Industrial Investigations or the assignment of experts to the districts will be submitted to the assistant forester with a request for the data or other special assistance desired. The assistant forester will arrange for the investigation required as soon as practicable.

Tests of material.

Material will be submitted to the Office of Industrial Investigations by district foresters for tests by manufacturers of special products outside of the district, when advisable and practicable, in accordance with plans made in advance with the chief of that office.

Conferences.

The chief of Industrial Investigations will visit the National Forest districts from time to time for conference, in order to correlate the work of his office with that of the districts as effectively as possible.

INDUSTRIAL INVESTIGATIONS AND FOREST PRODUCTS LABORATORY.

Current information.

It is essential that the Forest Products Laboratory be kept currently in touch with the work done and results obtained by Industrial Investigations because of the close bearing of such data upon the studies conducted at the Laboratory. The director of the Laboratory will designate certain of his assistants from time to time who will be responsible for the review and compilation of all data obtained on uses of wood. The chief of Industrial Investigations will send to the Laboratory for review by such designated members of the staff copies of progress reports and other current material of value to the Laboratory.

Review of working plans.

Working plans for new projects proposed by Industrial Investigations will be sent to the Laboratory for review and suggestions before the work is begun; and all manuscripts on industries, species, and other subjects will be sent to the Laboratory for review prior to their publication.

Working plans for new projects proposed at the Laboratory will be submitted to Industrial Investigations for review and suggestions, when in the judgment of the director the work proposed has an important bearing on the field of the latter unit. Manuscripts having a similar bearing will be sent to Industrial Investigations for review prior to publication.

Special Laboratory tests.

The procedure outlined on page 11 for tests at the Laboratory of material sent from the districts will apply to tests and other special experiments required by Industrial Investigations in the prosecution of its studies.

APPORTIONMENT OF COSTS.

Testing material.

The cost of procuring and shipping testing material will be borne by the unit at whose instance the investigation was undertaken; by the Forest Products Laboratory when the material is required in connection with a Laboratory project; by Industrial Investigations when the material is required for projects assigned to that office; and by a National Forest district when the tests are to be made as part of a technical or administrative investigation in the district.

Details.

The cost of details of experts from the Forest Products Laboratory or Office of Industrial Investigations for assignments or conferences in the district will be borne by the unit furnishing the expert, except as other arrangements are made in special cases by the assistant forester.

ROUTINE PROCEDURE.

ADMINISTRATIVE CONTROL.

Action by Assistant Forester.

Action will be taken by the assistant forester in charge of the Branch on the following matters:

1. Allotments:
   (1) Annual allotment and appropriation estimates from each unit, prior to submission to the Forester.
   (2) Changes in suballotments affecting units of the Branch or major lines of work, but not changes affecting individual projects or investigations.
2. Plans of work:
   (1) Annual investigative program from each unit of the Branch, prior to submission to the Central Investigative Committee.
   (2) New investigative projects of a technical character proposed by any unit of the Branch during the year. Such projects will be held for the next meeting of the Central Investigative Committee or submitted to the Forester for immediate approval, as their importance and urgency may require.
   (3) Substitution of urgent work from the field for listed investigative projects at the Forest Products Laboratory.
3. Personnel:
   (1) Appointments, separations, promotions and disciplinary action, in the case of employees taken from civil service registers.
   (2) Proposed increases and decreases in the force employed by any unit of the Branch, including nontechnical help, for periods of 6 months or more.
   (3) Assignments and transfers affecting units or major lines of work, not individual projects.
   (4) Details of experts from the Forest Products Laboratory or Office of Industrial Investigations for special work in the six western districts.
4. Reports:
   Monthly and annual reports from all units of the Branch; special reports as requested.
5. Manuscripts of publications, prior to submission to the Editor.
6. Cooperative agreements involving an expenditure of over $500 annually for the salary or expenses of members of the Service.
7. Questions of policy, changes in the Manual and other special matters.

Action by Branch units.

Action in all other matters will be taken by the executive officer in charge of the unit concerned, subject to the instructions contained in this Manual and to the instructions on Forest Service procedure given in the Manual on General Administration. The executive officers in charge of the Forest Products Laboratory, the Office of Industrial Investigations, and the respective districts will correspond directly with each other except when final action, of the character

indicated above, requires the approval of the assistant forester in charge of the Branch.

CORRESPONDENCE.

REQUESTS FOR INFORMATION.

Where referred.

Requests for information will be referred to the unit best equipped to furnish it, namely: (1) The Forest Products Laboratory, for data on wood properties, timber tests, preservative treatment, seasoning, pulp and paper manufacture and distillation; (2) Industrial Investigations, for data on statistics of production and on wood-using industries; (3) the district offices, for data on local experiments and local utilization or market questions.

Procedure.

Requests for information will be acknowledged by the receiving office, by postal card or letter, and transmitted immediately to the proper unit of the Branch for action.

GENERAL CORRESPONDENCE.

Within districts.

Requests for information and other correspondence within a National Forest district will as far as practicable be conducted through the district office. Exceptions to this rule in the collection of statistics or other general data will be made only with the approval of the assistant forester in charge of the Branch.

Outside of districts.

Otherwise each unit of the Branch will correspond on matters pertaining to its field of work directly with persons or firms throughout the United States and in foreign countries, subject to the procedure defined in the Manual on General Administration.

Carbons for other units.

Copies of correspondence bearing upon the work of another unit will in all cases be sent to such unit for its information. Carbons of letters from the Forest Products Laboratory or Office of Industrial Investigations to members of these units on detail in National Forest districts, which pertain to the work of the district, will be sent to the district office.

LABORATORY CORRESPONDENCE.

The correspondence of the Forest Products Laboratory will be signed by the director. Members of the Laboratory staff other than the acting director may be authorized by the director to sign certain classes of correspondence when advisable in his judgment.

INDUSTRIAL INVESTIGATIONS CORRESPONDENCE.

Correspondence originating with the Office of Industrial Investigations will be signed by the chief. Members of the office may be authorized by the chief to sign certain classes of correspondence when advisable in his judgment.

STATION CORRESPONDENCE.

With outside parties.

Men in charge of stations may correspond directly with outside parties on the work of their stations. Copies of such correspondence, except that on purely routine matters, will be forwarded to the executive officer to whom the station reports.

Copies of Service correspondence.

Copies of correspondence relating to the work of the station, originating with the assistant forester or executive officer in charge, will be forwarded promptly to the station. When such correspondence originates with the assistant forester, copies for the station will be sent through the executive officer in charge with additional carbons for his files.

MONTHLY REPORTS.

STATIONS.

Not later than the 5th day of each month the officer in charge of each station will submit to the executive officer to whom he is responsible a report on the work of the previous month. This report will contain a discussion of the progress on all projects assigned to the station, a statistical statement, a financial statement and any general comments necessary. The forms to be followed in such statements are shown on pages 39 and 40 of the Appendix.

DISTRICT OFFICES.

A section dealing with Forest Products will form a part of the regular monthly report from each district forester to the Forester. This section will include a discussion of the progress on all technical projects, listed by title and number, a statement of the general or administrative investigations under way or proposed, and such comments and recommendations on the work and personnel as are needed. Copies of the complete monthly report from each district will be sent to the Forest Products Laboratory.

FOREST PRODUCTS LABORATORY.

Section reports.

Each section of the Laboratory will submit to the director not later than the 5th of each month a report on the work of the previous month. This will include a statement of progress on all projects, a statistical statement, and any general comments necessary. The form for statistical statements is given on page 40 of the Appendix.

Laboratory report.

The reports from stations and sections will be summarized by the director for the monthly report of the Forest Products Laboratory. This report will be forwarded to the assistant forester in charge of the Branch not later than the 15th of each month. Copies will be sent to all district offices.

INDUSTRIAL INVESTIGATIONS.

The chief of Industrial Investigations will submit to the assistant forester in charge of the Branch not later than the 5th of each month a report on the work of the previous month. This report will include a statement of progress on all projects and such general comments and recommendations as are necessary. Copies will be sent to the Forest Products Laboratory and to each district office.

ANNUAL REPORTS.

FOREST PRODUCTS LABORATORY.

An annual report will be submitted to the assistant forester by the director of the Forest Products Laboratory not later than July 15 of each year. This report will review the work of the Laboratory during the past fiscal year, discussing particularly broad questions of organization, policy and lines of work rather than detailed investigations.

DISTRICT OFFICES.

The work in Forest Products will be discussed in the nonstatistical annual report of each district forester. Copies of such reports will be sent to the Forest Products Laboratory.

FILES.

GENERAL CLASSIFICATION.

The files of the Branch will contain records of four general classes:

Test records.

(1) Test records, including all experimental data not yet analyzed or put in final form. Such records will be filed at the Forest Products Laboratory in the section of computing. They will be classified by shipment and filed by project number as far as possible.

Project records.

(2) Reports, papers and correspondence relating to specific projects. This class includes all project records not coming under Class 1, namely: Preliminary reports, cooperative agreements, working plans, progress reports, inspection reports and project reports, together with all correspondence related to them. Such records will be classified by projects and filed by project numbers. Shipment descriptions will be filed serially by shipment numbers.

Classified information.

(3) Information not secured in connection with a project. This includes all data not contained in Classes 1 and 2 and which can not be classified by project; information not forming an essential part of the project records; and information secured in project investigations, classified by subjects. This file should include a duplicate copy of final project reports and a classified index to the project file.

Correspondence.

(4) Correspondence of a supervisory character related to projects will be filed by project number. Correspondence containing important data not related to a particular project will be filed under Study numbers. Other correspondence will be filed alphabetically.

FILING SCHEMES.

Filing schemes conforming with the foregoing classification and with the general rules prescribed by the Forester will be employed by the executive officer in charge of each unit of the Branch. The files of Industrial Investigations will include correspondence on all matters handled by the assistant forester in charge of the Branch except special records of a confidential character, which will be kept in his own office.

MATTERS OF GENERAL ROUTINE.

The instructions contained in the Manual of General Administration and Protection on matters of general routine, not covered specifically in this Manual, will govern members and units of the Branch of Forest Products.

COOPERATION WITH COMPANIES, ORGANIZATIONS AND INDIVIDUALS OUTSIDE OF THE FOREST SERVICE.

POLICY.

It is the policy of the Forest Service to secure to as large an extent as practicable the cooperation of the wood-using industries most directly concerned with the subjects or problems under investigation. The desirability of cooperation and its exact terms will be determined in each specific case, in accordance with the following general policy and procedure:

POLICY IN COOPERATION.

COMMERCIAL APPLICATION AND DEMONSTRATION OF EXPERIMENTAL DATA.

Check on commercial scale necessary.

As a general rule, no investigation conducted by the Branch of Products will be regarded as complete until the results obtained experimentally have been checked on a commercial scale and their industrial application determined. This will ordinarily be accomplished through cooperation with individuals or companies using wood and who are commercially interested in the possibilities of the processes or articles in question.

Repeated cooperation covering same ground inadvisable.

After experimental results have been satisfactorily checked on a commercial scale and their applicability to wood-using industries demonstrated, further cooperation covering the same ground will not be entered into. This course is essential to restrict the activities of the Branch to the determination of improved methods of using wood and to avoid the danger of becoming consulting experts for private interests.

Cooperation in construction of commercial plants.

The design, construction and operation of commercial plants for wood preservation, distillation, kiln-drying, and similar work may be undertaken in exceptional cases, when a new process will be demonstrated and the plant used, at least in part, for experimental work from which the Service will derive needed information. If new information will not be gained by the Service from the operation of such a plant, or new processes not yet commercially established are not to be demonstrated, the cooperation should not be undertaken. The information of the Service on such plants, including designs and specifications, should, however, be made available to anyone interested. The Service may also indicate the approximate cost of the construction and operation of such plants and submit suggestions on the plans and specifications if desired. Under such circumstances, however, applicants should be referred to consulting engineers, the Service furnishing only such general advice and assistance as can be given at slight cost.

Inspection of plants or processes.

The Service may on request examine the methods of individuals or companies in handling forest products and prepare plans for improving such methods, provided that the purpose is primarily to reduce waste and to obtain information of general value to the industries concerned. If no new information will probably be obtained, such work should not be undertaken but the applicant referred to a consulting expert.

REMUNERATION.

Salary and expenses of Forest officers.

In cases of active cooperation, there should be a remuneration to the Service equivalent to the total cost of the work done for the cooperator, including both the time and expense of the members of the Service detailed to the project. Such remuneration may be reduced by the extent to which the work is strictly experimental and of value chiefly to the Service rather than to the cooperator. When practically all of the work proposed is investigative, the Service having little or no expert knowledge on the subject to begin with, and the results will be of value chiefly to the general public, the charge to the applicant may be made comparatively low or eliminated altogether.

Furnishing material.

Whenever practicable, arrangements will be made with cooperators or others especially interested in the investigation to furnish all of the material necessary for the work.

PROCEDURE IN COOPERATION.

COOPERATIVE AGREEMENTS.

Written agreements covering cooperation.

As far as practicable, cooperative projects will be covered by written agreements. Such agreements are required whenever cooperative investigations of a specific character are to be continued for a period of six months or longer; or when the total expenditure of the

Forest Service on the work proposed will exceed $100. Cooperative agreements should state clearly the work to be done and the terms for doing it agreed upon by the Service and the cooperator. They will bear the same title and number as the projects in connection with which the cooperation is entered into. The form and general terms of cooperative agreements, with a discussion of their use, are given on pages 36 to 39 of the Appendix.

Preparation of agreements.

The preparation of a cooperative agreement will be authorized in each instance by the executive officer in charge of the unit of the Branch in question. In no case will any subordinate member of the organization obligate the Service to undertake cooperation without the specific approval in advance of the executive officer to whom he is responsible.

Approval of agreements.

Cooperative agreements with individuals, companies or corporations involving the expenditure of not more than $500 annually in the time and expenses of members of the Service, whether from Service funds or from funds to be deposited by the cooperator, will be approved by the executive officer in charge of the unit of the Branch concerned. Agreements with individuals or companies involving an annual expenditure of more than $500 and agreements with other bureaus of the Federal Government will be approved by the Forester. Agreements with States and with other departments of the Federal Government will be approved by the Secretary of Agriculture.

Summary of procedure.

The procedure in cooperative agreements is as follows:

(1) Agreement authorized by executive officer in charge of the unit.

(2) Agreement prepared by member of the Service conducting the project and executed by the cooperator.

(3) Agreement approved by executive officer in charge of the unit, if within his authority; otherwise initialed by him and submitted to the Assistant Forester, who will initial the agreement if it meets with his approval and submit it to the Forester.

(4) Copies of approved agreement filed: (*a*) With cooperator; (*b*) at the office in charge of the project; (*c*) at the Washington office in the case of agreements approved by the Forester or Secretary.

POLICY.

The following discussion of questions of policy are for the guidance of members of the Branch of Products in dealing with specific cases:

INVESTIGATION OF PATENTED OR PROPRIETARY ARTICLES.

Undertaken only when of general value.

Investigations of patented or proprietary articles, materials or processes will be undertaken only when the data sought are needed by the Service or will be of general public benefit. Such investigations will not be undertaken solely for the information or benefit of

the individual or company interested. If such studies are undertaken, it is immaterial whether the company or individual is a cooperator in the work. The essential thing is that the Service obtain the best conditions for a successful investigation. In no case will a charge be made by the Service for such work but the individual or company interested may furnish without charge materials or facilities for the investigation.

PUBLICATION OF DATA AFFECTING COMMERCIAL INTERESTS.

The Forest Service will not hesitate to publish the results of scientific investigations, when conclusively established, regardless of the effect of such publication, either beneficial or detrimental, upon commercial interests engaged in exploiting the articles or processes investigated. It is, however, essential that such publications be restricted to data which have been scientifically determined beyond possibility of error. This will ordinarily require publishing information only which has been obtained by the Forest Service itself. Information from other sources should be included in publications affecting existing commercial interests only when its authenticity is as certain as if it had been obtained by the Forest Service in the first instance.

Use of proprietary names.

The names of patented or proprietary processes and articles may be used in such publications, preceded by a qualifying phrase such as "Preservatives sold as." No statement other than a mere presentation of the facts should be published which could be construed as an endorsement by the Forest Service of any commercial article or process.

CONFIDENTIAL INFORMATION.

Members of the Forest Service may and should receive confidential information. Assurance may be given that such information will not be used in any way which would make public the operations of an individual plant or the details of the business of any specific operator. No guarantee to this effect, however, can be given other than the good faith and honesty of the officer who receives the information.

DISPOSAL OF PRINTS AND DESIGNS.

Photographic prints, blue prints, sketches and designs may be sold at cost with 10 per cent additional (act of March 4, 1907), with the approval of the Forester; or given without charge to cooperators and in other cases where valuable educational results will be obtained. See Manual on General Administration and Protection, page 57.

COMPILATION OF DATA FROM OUTSIDE SOURCES IN LABORATORY PUBLICATIONS.

The greater part of the material prepared for publication at the Forest Products Laboratory will be original data experimentally established at the Laboratory itself. Publications of such data, however, should include references to similar or related data obtained elsewhere as far as necessary to make the publication of the maximum value to those interested in the subject with which the publication

deals. The reference to such outside data may be restricted to a brief summary and bibliography, or discussed in as much detail as the specific publication requires. Outside data must be used with great caution in publications affecting existing commercial interests and limited only to such as have been established with absolute certainty. Subject to this limitation, it will be the policy of the Laboratory to include such other material in addition to that obtained by its own staff as will make its publications of the greatest value to the readers.

The same policy will be followed in the preparation of publications by other units of the Branch.

TECHNICAL PROCEDURE.

KINDS OF INVESTIGATIONS.

Investigations relating to Forest Products will be classed as *administrative investigations* and *technical investigations.* Administrative investigations are undertaken primarily to assist the administration of the National Forests. They seek specific information for local administrative needs. They do not require technical experiments or processes. They consist usually in the study of existing industries or methods and compilation of existing data. Technical investigations, while often undertaken to secure information needed in the administration of National Forests, require, as a rule, technical processes or experiments. They aim to develop new scientific principles or facts of broad application, or to assemble data for publication.

ADMINISTRATIVE INVESTIGATIONS.

Under control of district foresters.

Administrative investigations may be undertaken by district foresters whenever necessary in their judgment and conducted under their instructions in the manner best calculated to accomplish the objects sought. As far as practicable, such investigations should be included in the annual program submitted to the Central Investigative Committee, to keep the central committee and the Forester informed of proposed work and afford opportunity for criticism and suggestion. Administrative investigations should be conducted as far as practicable in accordance with the principles defined below which govern technical investigations. They will not, however, be subject to the technical procedure outlined hereafter. They will be listed by the central committee separately from the technical investigations. Furthermore, the district foresters will not be restricted by such lists but may initiate additional investigations of this character at any time during the year when need of them exists.

Relation to technical investigations.

When an investigation is undertaken for administrative purposes but involves technical processes or experiments, it will be classed as a technical investigation. Similarly, when an administrative investigation indicates the need of technical experiments, before all the data desired can be obtained, a technical investigative project should be proposed by the district forester. Such projects will be subject to the following technical procedure:

TECHNICAL INVESTIGATIONS.

FUNDAMENTAL PRINCIPLES.

In conducting technical investigations it is necessary:

(1) That the importance of the results sought be carefully weighed in comparison with other work proposed by the various units of the Forest Service, and that the work be correlated as far as practicable with any other investigations in the same or related fields.

(2) That the investigator have a clear conception of the purpose and value of the investigation and of the methods to be followed in conducting it, and that the purpose and methods be made matters of record.

(3) That the plan for conducting the investigation be perfected as far as possible before work is begun.

(4) That complete information on materials used be secured and recorded.

(5) That standard methods and terms be used as far as possible to coordinate the work of the entire Branch.

(6) That frequent partial summaries and analyses of results be made so that plans or methods may be modified as found necessary before the work has proceeded too far.

(7) That complete final summaries and analyses of results be embodied in a written report of permanent record.

The following procedure is established to meet these requirements:

PROJECTS.

The project is the unit for conducting technical investigations. It may consist of a series of tests or experiments conducted:

(1) For experimental research to develop new facts.

(2) For verification of experimental results on a commercial scale.

(3) For cooperation with outside parties in the application of scientific principles and processes developed by research in order to demonstrate their commercial value.

(4) For the collection of statistics and information pertaining to wood-using industries, waste, substitutes, etc., of a specialized and intensive character.

Projects may be conducted independently or in cooperation with individuals, states, or commercial organizations.

Designation of projects.

Every project will be assigned a number by the director of the Forest Products Laboratory or the chief of Industrial Investigations. As far as practicable, the project title and number will be assigned when it is decided to undertake the specific investigation. When a preliminary investigation is necessary to determine the advisability of the project, a number will not be assigned until the preliminary report has been made and approved.

Steps in projects.

Projects, as a rule, involve the following steps, certain of which may be eliminated in specific cases:

(1) Incorporation in annual investigative program.

(2) Preliminary investigation.

(3) Working plan.
(4) Description of materials.
(5) Progress reports.
(6) Inspection reports.
(7) Project report, which may or may not be published.

Where cooperation with outside parties is involved, a written cooperative agreement will ordinarily be prepared and executed, following the preliminary investigation.

INCORPORATION IN ANNUAL INVESTIGATIVE PROGRAM (FOREST SERVICE ORDER NO. 41).

Review by offices and committees.

Every proposed technical investigation will be submitted to the district investigative committee, if in a district; or to the members of the Service designated by the director of the Forest Products Laboratory or the chief of Industrial Investigations, as the case may be, to pass upon proposed investigations and make up an annual program for the unit of the Branch in question. The program of technical investigations for each unit, after approval by the executive officer in charge, will be submitted directly to the assistant forester in charge of the Branch. The assistant forester, in consultation with the director of the Forest Products Laboratory and the chief of Industrial Investigations, will thereupon make up an investigative program for the Branch of Products for submission to the Central Investigative Committee. After the annual investigative program of the Forest Service has been approved by the central committee and the Forester, the assistant forester will instruct each of the executive officers in the Branch as to the projects assigned to his unit for the ensuing year.

PRELIMINARY INVESTIGATIONS.

Purpose.

A preliminary investigation may be made to determine the advisability of a proposed project or to secure information upon which to base a working plan. Reports on preliminary investigations are termed "Preliminary reports." Suggestive outlines for such reports are given on pages 30 to 32 of the Appendix.

Summary of procedure.

The procedure followed in preliminary investigations and reports is as follows:

(1) Investigation ordered by the director of the Forest Products Laboratory, the chief of Industrial Investigations, or a district forester.
(2) Report prepared and signed by the member of the Service making the investigation.
(3) Report approved and initialed by the executive officer authorizing the investigation.
(4) Two copies of the report submitted to the director of the Forest Products Laboratory if the project is within the province of the Laboratory, or to the chief of Industrial Investigations if the project is within the field of that office.
(5) One copy of the report returned by the director or chief with comments and a statement of action required.

WORKING PLANS.

Importance.

The success of a technical investigation is often determined by the care exercised in planning the details of the work. Work under a project will not begin until a plan has been prepared by the member of the Service assigned to the investigation and approved by the proper officers. If a detailed plan can not be made at the outset, an outline describing the essential features of the investigation will be prepared and approved. Such outlines will be termed "Preliminary plans".

Scope.

As far as possible working plans will contain detailed instructions for collecting material and conducting the investigation. The discussion under each topic should be full and accompanied by any sketches or drawings which will assist in making the ideas of the writer clear and specific.

Designation.

Working plans will be given the title and number of the project under which they are prepared. When a working plan covers only a part of a proposed project, successive plans will be prepared and designated numerically (as Part 1, Part 2, etc.). When a working plan is revised, the revision will be designated alphabetically, as Working Plan 100*a*.

Approval.

Unless otherwise specified in the instructions transmitting the annual program of investigative work to each unit of the Branch, all working plans for technical investigations will be approved by the director of the Forest Products Laboratory or the chief of Industrial Investigations, in accordance with the nature of the investigation. In specific cases, designated in the instructions of the assistant forester, working plans will be submitted to him for approval.

Review by officers and committees.

Before any working plan is approved, the executive officer will obtain the judgment of the members of the Branch or of other branches who are most experienced in the kind of investigation proposed or otherwise best qualified to act, on the completeness of the plan, the choice of methods and materials to be used, the accuracy of the data to be obtained and any other features of the plan which affect the value of the entire investigation. At the Forest Products Laboratory every working plan will be submitted to a committee of experts designated by the director to pass upon all plans within specified fields of investigation. The judgment of any other members of the Branch wherever employed who are qualified for any particular reason to pass upon certain features of the work will also be obtained. Working plans for projects under Industrial Investigations will be submitted to the Forest Products Laboratory for comment and criticism before they are approved by the chief of office. Working plans prepared at the Laboratory which involve problems in the field of Industrial Investigations will be submitted to the chief of that office for review before they are approved. Plans which have a bearing upon the work of other branches will be referred to them for criticism and suggestions before final approval. It is essential that the judgment of any members of the Service whose opinion

would be of value in a specific investigation be secured before the working plan is approved by the executive officer.

Procedure with modifications.

Modifications of approved working plans will follow the same procedure as the original plan.

Working plan outlines.

A suggested outline for use in the preparation of working plans is given on pages 32 and 33 of the Appendix.

Summary of procedure.

The procedure followed in working plans is summarized as follows:

(1) Prepared and signed by a member of the Service assigned to conduct the project.

(2) Initialed by district forester or other executive officer supervising the work.

(3) Reviewed by committtee of experts on work of the general character involved or related lines of work and by others whose judgment on the plan should be obtained.

(4) Reviewed by executive officers of other units of the Branch or of other branches.

(5) Approved by the director of the Forest Products Laboratory or chief of Industrial Investigations, in the case of plans within the respective provinces of each, or by the assistant forester in charge of the Branch when so directed.

(6) Filed at: (*a*) Office of final approval (Forest Products Laboratory or Industrial Investigations); (*b*) offices executing the work.

DESCRIPTION OF MATERIAL.

Material received for experimental purposes will be classified as "shipments" or "samples."

Shipment.

A shipment consists of a quantity of material handled as a unit before reaching a station, such as consignments of creosote, timbers for testing, material for pulpwood experiments and bulky chemicals. A shipment may be received in one or more installments, but different installments must have the same general history and characteristic properties. Each shipment will be given a symbol consisting of a letter indicating the receiving station and a serial number. For example, the first shipment received at the Forest Products Laboratory is designated "Shipment L–1"; the second shipment, "Shipment L–2", etc.

Shipment descriptions.

Shipments will be described in accordance with the instructions on pages 32 to 35 of the Appendix. The procedure in shipment descriptions is as follows:

(1) Prepared and signed jointly by persons collecting and receiving the material.

(2) Filed at: (*a*) Laboratory or Office of Industrial Investigations, as the case may be; (*b*) office or station supervising the work.

Sample.

Samples are relatively small quantities of material for chemical analysis or other technical examination. A sample may consist of a

representative part of a shipment, of a product of experimental work, or other material which requires examination. Samples will be collected in accordance with standard instructions, described by the transmitting officer, and designated at the receiving station. A sample designation consists of a letter indicating the class in which it belongs and a serial number. Instructions for collecting and describing samples are given on pages 35 and 36 of the Appendix.

PROGRESS REPORTS.

Nature.

From time to time as work on a project progresses, reports on the results secured will be prepared. These are "progress reports", bearing the title and number of the project. The procedure to be followed in such reports is as follows:

Summary of procedure.

(1) Prepared when called for by the executive officer in charge of the work.

(2) Approved by the executive officer in charge.

(3) Copies sent to offices which should be informed of its development.

(4) Filed at: (*a*) Office supervising the work; (*b*) Forest Products Laboratory or Office of Industrial Investigations, as the case may be.

(5) Summary of information sent to cooperators, if a cooperative project.

INSPECTION REPORTS ON DURABILITY TESTS.

Purpose.

In projects where material is placed in actual service to test its efficiency, inspections are required from time to time. Reports on such inspections will be designated "Inspection reports" (1, 2, etc.), bearing the title and number of the project. Outlines for such reports will be furnished by the director of the Forest Products Laboratory on request from the executive office in charge of any unit of the Branch.

Summary of procedure.

The procedure followed in inspection reports is as follows:

(1) Prepared and signed by person making the inspection.

(2) Initialed by executive officer in charge of the work.

(3) Approved by the director of the Laboratory.

(4) Filed at: (*a*) Executive office in immediate charge of the work; (*b*) the Forest Products Laboratory; (*c*) other offices which should be kept informed of the progress of the test.

(5) Copies sent to cooperators, if a cooperative project.

PROJECT REPORTS.

Nature.

A project report is prepared at the completion of each technical investigation. It should contain any photographs, drawings, diagrams, tables, etc., required to present the results in the most satisfactory way, together with a full discussion of the work from the beginning of the project to its completion. If all data obtained are not included in the report, it should contain a complete list of the data records secured.

Summary of procedure.

The following procedure will be followed in project reports:

(1) Prepared and signed by the member of the Service conducting the project.

(2) Initialed by executive officer in immediate charge of the work.

(3) Approved by the director of the Laboratory or chief of Industrial Investigations, and other work which should be done in the nature of further investigation, commercial demonstration, etc., indicated.

(4) Filed at: (*a*) Executive office in immediate charge of the work; (*b*) Forest Products Laboratory or Office of Industrial Investigations in projects within the respective provinces of each, including original drawings, tables and other data; (*c*) other offices or branches interested in the project; (*d*) Forest Service library.

(5) Revised copy sent to cooperators, if a cooperative project.

GENERAL INSPECTIONS.

Inspections of plans, commercial processes, etc., will be made when authorized by an executive officer. The procedure in such inspections is as follows:

BY MEMBERS OF FOREST PRODUCTS LABORATORY.

(1) Inspections will be made when authorized by the director.

(2) Reports will be prepared in accordance with suggestive outlines approved by the director.

(3) Reports will be filed at: (*a*) The Forest Products Laboratory; (*b*) the Office of Industrial Investigations; (*c*) the district and Chicago offices if of value in their work.

BY MEMBERS OF OFFICE OF INDUSTRIAL INVESTIGATIONS.

(1) Inspections will be made when authorized by the chief of office.

(2) Reports will be prepared in accordance with outlines approved by the chief of Industrial Investigations, signed by the person making the inspection and approved by the chief of the office.

(3) Reports will be filed at: (*a*) The Office of Industrial Investigations; (*b*) the Forest Products Laboratory; (*c*) the district and Chicago offices if of value in their work.

BY MEMBERS OF DISTRICT OFFICES.

(1) Inspection will be made when authorized by the district forester.

(2) Suggestive outlines for inspection reports will be furnished on request by the director of the Forest Products Laboratory or chief of Industrial Investigations.

(3) Reports will be signed by the person making the inspection and approved by the district forester or an assistant district forester to whom authority may be delegated by the district forester.

(4) Reports will be filed at: (*a*) District office; (*b*) Forest Products Laboratory; (*c*) Office of Industrial Investigations.

PUBLICATIONS.

Assignments.

Assignments for the preparation of publications will be made by the executive officer in charge of each unit in accordance with the approved investigative programs and the instructions of the assistant forester. Authors will prepare outlines and synopses of proposed manuscripts which they will submit to the executive officer in charge of their work for approval, and to such other units or branches as he may deem advisable for criticism or suggestions.

Approval of manuscripts and addresses.

Manuscripts prepared for publication by the department or elsewhere or for delivery at public meetings will be submitted to the executive officer in charge for approval before publication or delivery. The publication of articles will be further subject to the general procedure established by the Secretary or Forester.

APPENDIX.

PRELIMINARY REPORTS.

Preliminary reports vary greatly in different projects, but in general are of two classes:

(1) Those summarizing existing knowledge on a given subject.

(2) Those discussing conditions at a particular plant or place at which it is proposed to conduct a project.

In every case an outline for the preliminary report must be approved by the executive officer before an investigation is begun. The following outlines are suggestive only, and may be modified as required for adaptation to specific projects.

Form of title-page.

UNITED STATES DEPARTMENT OF AGRICULTURE.

FOREST SERVICE.

FOREST PRODUCTS LABORATORY.

DISTRICT __

OR

OFFICE OF INDUSTRIAL INVESTIGATIONS.

PROJECT NO. ____

_____
(Title of project.)

_____

_____

PRELIMINARY REPORT.

(Signed) _____

_____
(Title.)

_____
(Date.)

Approved:

_____

_____
(Title.)

_____
(Date.)

For General Investigations.

PROJECT NO. ____

Title: _____

Preliminary report.

1. Purpose.
   - *a.* Need of work.
   - *b.* Anticipated results.
2. Previous work.
   1. Forest Service.
      - *a.* Date, place, and auspices under which work was done. (Give especial attention to factors influencing quality of work.)
      - *b.* Apparatus and methods employed.
      - *c.* Results.
      - *d.* Criticisms and conclusions.
   2. Other investigations.
      - *a.* Date, place, and auspices under which work was done. (Give especial attention to factors influencing quality of work.)
      - *b.* Apparatus and methods employed.
      - *c.* Results.
      - *d.* Criticisms and conclusions.
   3. Bibliography.
   4. Recommendations, with reasons.
   5. Estimates.
      - *a.* Time required.
      - *b.* Cost.
        1. Salaries.
        2. Equipment.
        3. Material.

For investigations of plants or processes.

PROJECT NO. ____

Title: _____

Preliminary report.

1. Purpose.
   - *a.* Need of work.
   - *b.* Anticipated results.
2. Business organization.
   - *a.* Name of operator and owner.
   - *b.* Location of administrative offices.
   - *c.* Representative dealt with.
3. Patents, franchises, concessions.
4. Raw materials.
   - *a.* Kind (species, form, condition).
   - *b.* Source.
   - *c.* Amount.
   - *d.* Cost f. o. b. plant.
5. Plant.
   - *a.* Any points of interest about its history.
   - *b.* Layout. It is desirable to have this section of the report accompanied by sketches or drawings, as follows:
     1. General plan of plant, showing yards, general arrangement of buildings, etc.
     2. Plan of plant proper, showing general arrangement of apparatus.
6. Apparatus. (Standard equipment may be described by trade designations. Special equipment in handling, working, or treating wood should be described in detail. Whenever possible the verbal description should be supplemented by sketches showing the pertinent details of the apparatus. In some cases information on power, light, heat, water supply, ventilation, fire protection, etc., may also be desired.)

7. Processes.
   All processes of handling, treating, or working wood should be described in detail. Begin with the material as received and describe successively the different stages of manufacture or treatment. The description should be divided according to the following or some other convenient form, the cost of each step being discussed:
      1. Preliminary handling and treatment.
      2. Conversion process.
      3. Finishing process.
8. Products and by-products.
      1. Kinds.
      2. Amounts.
      3. Inspection and grading.
      4. Selling prices.
      5. Uses.
9. Waste products.
      1. Kinds.
      2. Amounts.
      3. Attempted and possible uses.
10. Remarks and recommendations.
11. Estimates.

WORKING PLANS.

Form of title-page.

UNITED STATES DEPARTMENT OF AGRICULTURE.

FOREST SERVICE.

FOREST PRODUCTS LABORATORY.

DISTRICT __

OR

OFFICE OF INDUSTRIAL INVESTIGATIONS.

PROJECT NO. ____

_____
(Title of project.)

_____

WORKING PLAN NO. ____

(Signed) _____

_____
(Title.)

_____
(Date.)

Approved:

_____

_____
(Title.)

_____
(Date.)

NOTE.—If the project is conducted at a permanent station, put the name of the station on the title-page.

Outline of plan.

Project No. ____ Title: _____

Working Plan No. ____

(1) Purpose of work.
(This paragraph should state clearly and fully just what the work is expected to accomplish.)
(2) Detailed list of materials needed and instructions for their collection.
(3) Detailed instructions for carrying on work.
a. Concise statement giving the method of grouping and marking material. The system used will be standard, but just what will constitute a "shipment," "piece," "stick," etc., should be clearly stated.
b. Description of methods of testing or treating. Each chemical or preservative treatment or method of testing, soaking, seasoning, etc., not standardized, should be briefly but fully described. Standard methods will be described by reference to laboratory instructions or other authorities. The character to be used in the "marks" of a specimen to indicate the treatment to which is has been subjected, should also be defined.
c. Description of all special methods of keeping records, both before and after test.
d. Moisture and similar test determinations to be made.
e. Photographs, sketches, and drawings.
f. Final disposition of material.
(4) Future inspection or treatment of material.

SHIPMENT DESCRIPTIONS.

The following terms will be used in marking and describing shipments:

Piece.

A piece is the first subdivision of a shipment which it is desirable to regard as a unit. It may be a log, a stringer, a strip from which small specimens are to be taken, a wagon axle, a bale of freight, etc. The pieces composing a shipment will be numbered serially. The piece number will consist of the number of the shipment and the serial number of the piece. For example, the numbers of pieces in shipment 10 would be 10–1, 10–2, etc.

Stick.

The term stick is applied to specimens secured from the first subdivision of a piece. A stick number will consist of the number of the piece from which it is cut and a serial number. For example, sticks secured from piece No. 10–1 will be numbered 10–1–1, 10–1–2, etc.

Mark.

A mark consists of one or more characters signifying factors which are to be considered in analyzing the test data. Arabic numerals in a mark signify that the specimen was secured from a stick. Letters, Roman numerals, and other characters may be embodied in a mark to designate methods of drying, treating, position in the tree, etc. when it is desirable to make a record of such factors.

The information required on material used in experiments may be divided into the following general classes:

No. 1. Field notes.

All material used in research work will generally be collected by a representative of the Forest Service, who will secure such information on its origin as may be indicated in the working plan. When the material collected is wood, the field notes will be entered on sample form *a*. For material other than wood, the information desired will be specified in the working plan. The collector will classify the material collected into shipments, pieces, sticks, etc., in accordance with the directions contained in the working plan, and use these designations in the preparation of his notes. Unless the collector is absolutely sure of the identity of the specimens he should not make collections.

Form for field notes.

Sample form *a*.

UNITED STATES DEPARTMENT OF AGRICULTURE.

FOREST SERVICE.

Project No. ____ Shipment _____

Shipment descriptions—Field notes.

Tree number _____; Species _____
Locality cut: State_____; County_____; Township_____; Date cut_____; Slope_____; Absolute elevation_____; Aspect_____; Undergrowth_____; Soil_____; Height_____; Seeding or sprout_____; Crown_____; D. B. H._____; Age_____; Stem_____; Date sawed_____; How and when transported from woods_____

List of specimens sawed.

Log. No.			

Remarks: _____

_____

No. 2. Notes on Manufacturing and Shipping.

The notes on manufacture and shipment called for in sample form *b*, which is appended, will also be made by the collector of the material.

As soon as the material is shipped, the collector will forward by registered mail duplicate copies of his notes entered on sample forms *a* and *b* to the man in charge of the station to which the material is shipped.

Form for notes on manufacturing and shipping.

Sample form *b*.

UNITED STATES DEPARTMENT OF AGRICULTURE.

FOREST SERVICE.

Project No. ____ Shipment _____

SHIPMENT DESCRIPTION.

Notes on manufacturing and shipping.

Bill of material composing shipment_____

_____

Cut in: State_____; County_____; Township_____; Manufactured at_____; Date_____; Shipped_____ (Date.) via_____ (Routing.);

In_____ (Kind and number of car.); Origin and history_____

_____

Condition when shipped_____

No. 3. Notes on condition and disposition of material when received at destination.

These notes will be entered by the man in charge of the station on sample form *c*. He will then transmit to the executive officer in charge a copy of these notes, as well as a copy of the notes transmitted to him by the collector of the material. Sample form *c* is as follows:

Form for notes at receiving station.

Sample form *c*.

UNITED STATES DEPARTMENT OF AGRICULTURE.

FOREST SERVICE.

Project No. ____ Shipment _____

SHIPMENT DESCRIPTION.

Notes on condition and disposition of material when received at destination.

Received at _____ (Name of Station.) Date _____

Condition when received _____

_____

How stored _____

_____

Records:

Correspondence _____

Photographs _____

Care in descriptions essential.

The interpretation of experimental data very often depends upon an accurate knowledge of the material used in the experiments, and no effort should be spared in making shipment descriptions as accurate and complete as possible.

DESCRIPTION OF SAMPLES.

Specimens for Laboratory collection.

The Forest Products Laboratory is building up a collection of authentic specimens of (1) crude or raw materials, (2) intermediate products forming a series which illustrate processes of manufacture, and (3) final products as put on the market. Specimens are particularly desired of:

(1) Woods which have been identified botanically. Whenever possible, these specimens should be taken from average merchantable trees and should include both pith and bark in one piece. A section 1 foot or more in length is desirable, but smaller pieces are acceptable.

(2) Samples of wood which have been subjected to different processes. It is desirable to have a description of the processes to which the wood has been subjected, as well as samples of the material used in its treatment.

(3) Samples of materials used in treating wood.

(4) Wood distillation products.

(5) Pulp, paper, and other fiber products.

In classes 3, 4, and 5 a description of the process used in manufacturing the products should in all cases accompany the samples.

(6) Samples of fungous growth causing decay. A very complete description should accompany such specimens, as otherwise they are of little value.

(7) Any rare, uncommon, or especially interesting samples of growth or changed physical structure of wood.

Description of Laboratory specimens.

The collector of any sample will fully describe it on sample form *d*, which is appended, and transmit the description with the sample to the director of the Forest Products Laboratory, Madison, Wis. The shipping tag on the sample will in all cases bear the name of the sender and the point and date of shipment.

On receipt at the Laboratory the sample will be given a number, entered on the sample form *d* transmitted by the collector. Reports on samples submitted for examination will bear the sample number and be filed with the sample description. All samples or specimens put into the permanent collection will bear the sample number.

Forms for describing samples.

Sample form *d*.

UNITED STATES DEPARTMENT OF AGRICULTURE.

FOREST SERVICE.

Project No. ____. Sample No. _____

SAMPLE DESCRIPTION.

Class _____

Name of material_____

History of sample:

Growth conditions_____

(Give features in detail.[1])

_____

Manufacturing conditions_____

(Including short description of process.[1])

_____

How obtained _____

(In detail. If a portion of a shipment give the shipment number.)

_____

By whom sent_____

(Name and address.)

Date sent_____

How shipped_____

Remarks _____

_____

Conditions at Laboratory:

Date of arrival_____ Station_____

Condition in which received_____

Marks and labels_____

(Date on the package.)

_____

How stored_____

Tested under Project No._____

Why sent_____

_____

Work to be done_____

_____

Disposal of unused portions_____

_____

Records:

Correspondence_____

(With dates.)

_____

Photographs_____

Reports submitted_____

(To whom, date, title, number of copies required.)

_____

File_____

[1] In case space is not sufficient, use sample form *a* or sample form *b* of Shipment Description.

FORM OF COOPERATIVE AGREEMENT.

Project No. ____

Title_____

UNITED STATES DEPARTMENT OF AGRICULTURE.

FOREST SERVICE.

Cooperative agreement for investigations in forest products.

Between_____, of_____,
(Name or cooperator.) (City and State.)

party of the first part, and the Forester, Forest Service, United States Department of Agriculture, party of the second part.

WHEREAS the parties hereto desire to cooperate in conducting investigations

(State purpose and character of the investigations.)

NOW, THEREFORE, THIS AGREEMENT WITNESSETH:

FIRST. The party of the first part, for and in consideration of the promises and agreements of the party of the second part, as hereinafter contained, does hereby promise and agree as follows:

(1) To pay to the Chief, Office of Accounts, Forest Service, Washington, D. C., to be placed to the credit of the United States, the sum of_____ $\frac{}{100}$ dollars ($_____)_____

(Terms of payment, by specified dates, per month, year, etc. When periodic payments are to be made, add "during the period that this agreement and all renewals thereof remain in force." When an additional cash deposit is required to insure the carrying out of the agreement, add "_____ $\frac{}{100}$ ($_____) of which amount will be refunded by the Forester upon the satisfactory completion of my (or our) obligations assumed hereunder.")

(2) To furnish without charge to the Forest Service the following timber, materials, apparatus, and labor, to be used in conducting said investigations:

(3) To report, when requested by the Forest Service, upon the application of the results attained in said investigations.

(4) To permit or require no laborer or mechanic employed on any work contemplated by this agreement to work more than eight hours in any one calendar day upon such work; if any laborer or mechanic is required or permitted to work more than eight hours as aforesaid, then to pay to the United States a penalty of five dollars ($5.00) for each laborer or mechanic for every calendar day in which such laborer or mechanic is required or permitted to labor more than eight hours upon the work contemplated by this agreement, according to the provisions of the Act of Congress approved June 19, 1912.

(Insert any additional obligations assumed by the cooperator.)

(5) That all moneys paid under this agreement will, upon failure on his (or their) part to fulfill all and singular the conditions and requirements herein set forth or made a part hereof, be retained by the United States, to be applied as far as may be to the satisfaction of his (or their) obligations assumed hereunder.

To deliver herewith, as a guarantee of faithful performance of the promises and agreements contained herein, a bond in the sum of _____ $\frac{}{100}$ dollars ($____).

SECOND. The party of the second part, for and in consideration of the promises and agreements of the party of the first part, well and faithfully executed, does hereby promise and agree as follows:

(1) To _____

(Insert brief description of tests to be made or other obligations assumed by Forest Service.)

(2) To report _____ to the party of the first part
(Monthly, bimonthly, etc.)
the progress of the investigations conducted hereunder, and at the termination of said investigations to make a final and complete report on the results obtained, together with recommendations.

(3) To pay any expense incurred by the party of the second part in conducting said investigations from the cooperative fund deposited with the United States for investigations in forest products. (Or "from the appropriation by Congress for 'General expenses, Forest Service,' 191—, Forest Products.")

THIRD. It is mutually understood and agreed by and between the parties hereto as follows:

(1) That this agreement shall take effect on the day it is executed by the party of the second part and shall expire on the thirtieth day of June, one thousand nine hundred and _____, but the same shall be subject to renewal thereafter from year to year, by mutual consent of the parties hereto, which renewal must be expressed in writing by said parties at least 15 days prior to the date of expiration.

(2) That the party of the second part shall have unrestricted right to publish and distribute the results obtained from said investigations in advance of their publication by the party of the first part.

(3) That all _____
(Apparatus, implements, materials, etc.)
_____ furnished by the party of the first part and not consumed will remain the property of said party when said investigations are terminated. All machines, implements, and materials furnished by the Forest Service, and all specimens, samples, models, plans, drawings, negatives, and notes or manuscripts which have resulted from the investigations conducted hereunder and which may be desired by the party of the second part for record or publication will be retained by said party of the second part.

(4) That this agreement may be terminated at any time by either party hereto by giving _____ written notice to the
(Specify number of days or months.)
other of such intention.

(5) That the decision of the Secretary of Agriculture will be final in the interpretation of the conditions and requirements of this agreement.

(6) That this agreement shall not be assigned in whole or in part; that no Member of or Delegate to Congress or Resident Commissioner, after his election or appointment and either before or after he has qualified and during his continuance in office, and no officer, agent, or employee of the Government shall be admitted to any share or part of this contract or agreement, or to any benefit to arise thereupon, and that no convict labor shall be employed in carrying out the terms of this agreement, in accordance with Executive order signed May 18, 1905. Nothing, however, herein contained shall be construed to extend to any incorporated company where such contract or agreement is made for the general benefit of such incorporation or company. (Sec. 3741, Revised Statutes, and secs. 114–116, act of Mar. 4, 1909.)

IN WITNESS WHEREOF the said party of the first part has hereunto signed his name on this the _____ day of _____, 19____, and the said party of the second part has hereunto set his hand on the date below written.

WITNESSES:

_____ _____
(Name.)

_____ _____
(Title.)
Party of the first part.

Signed by the party of the second part this _____ day of _____, 19____.

_____
Forester,
Party of the second part.

In agreements approved by District Forester substitute "District Forester, District No. ____," for "Forester" in first clause and thereafter "District Forester." Similarly in agreements approved by the Director of the Laboratory use "Director, Forest Products Laboratory" and "Director."

In agreements approved by the Secretary, use "Secretary United States Department of Agriculture" in the first clause and thereafter "Secretary."

Explanation of Agreement Form.

The foregoing form can be used in all kinds of cooperative agreements by omitting clauses or phraseology inapplicable and inserting, in the blanks indicated, special clauses required for a particular project.

Deposits.

All deposits under cooperative agreements will be made with the Chief, Office of Accounts, Washington, D. C. Allotments to the unit of the Branch conducting the work will be made in the regular manner, on green slips initiated by such unit and approved by the Assistant Forester in Charge of the Branch.

Guarantee on part of cooperator.

A special guaranty that the cooperator will fulfill the obligations assumed by him may be required in the form of:

(1) An additional cash deposit, to be refunded on the satisfactory completion of the agreement; or

(2) A bond.

In the first instance, a provision for refunding such deposit will be inserted in Clause (1), Part One, and the first part of Clause (5), Part One, will be used. In the second instance, the second part of Clause (5), Part One, will be used. Bonds should be prepared on Form 377.

Such guaranties will be required only in exceptional cases when neecssary to protect the Forest Service from serious loss due to failure on the part of the cooperator to fulfill the obligations assumed under the agreement.

Termination.

All agreements terminate automatically at the end of the current fiscal year, but may be renewed, year by year, by mutual consent. (Clause (1), Part Three). Termination at other times may be provided for, if desirable in any specific case, by the use of Clause (4), Part Three. The use of this clause and the period of advance notice required will be optional with the executive officer in charge of the project. The Forest Service will, however, resort to termination under this clause only in exceptional cases where the spirit or terms of the agreement have been seriously violated by the cooperator.

STATION REPORTS.

Men in charge of stations will be responsible for the preparation of Station Reports.

A record of materials on hand at the end of each month and of experimental materials used or treated during the month will be entered on the form "Material Received and Tested," and transmitted as a part of the Station Report.

A statement of all expenses incurred at the station will be entered on the form, "Financial Report."

The body of the report will discuss the work done, treating each project separately.

The information contained in station reports will furnish the basis for reports to cooperators in investigations conducted at the station. Reports to cooperators will be sent direct by the executive officer in charge of the unit conducting the project.

Station Report Forms.

MONTHLY REPORT.

Name of Station.

1 Progress of work during month.
(Under this head each project should be discussed separately. Projects should be described by number and title.)
2. Material received and tested during month.

3. Financial statement.

(If the expenditures cover more than one project, apportionment will be made and charged in the report to the proper project. For example, if A received a salary of $100 per month and worked for half a month on Project No. 10 and the other half of the month on Project No. 30, $50 will be charged to Project No. 10 and a similar amount to Project No. 30. The same method of apportioning the expenses will hold for other items. Under the column headed "Remarks" will be given such statements as labor employed and charged on Form A or Form 4 or particular apparatus purchased or express and freight bills paid.)

4. General remarks and recommendations.

(This section should be devoted to a discussion of the effectiveness of working plans and recommended changes in them. Other matters of general interest should also be mentioned.)

MATERIAL RECEIVED AND TESTED.

Station, _____ Date, _____ to _____, inc.

Material on hand.				Material tested or treated.			
Kind of material.	Shipment number.	Amount.[1]	Condition.	Kind of material.	Shipment number.	Amount.[1]	Remarks.

(Signed) _____
In Charge of Station.

[1] May be in gallons, pounds, "pieces," "sticks," etc. State specifically.

FINANCIAL REPORT.

Station, _____ Date, _____ to _____, inc.

Name.	Project No.	Expenditures.					Balance, L. A.	Remarks.
		Form A.	Form 4.	T. R.	Salary.	Total.		

Approved:

_____
In Charge of Station.

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